AN INVESTIGATIVE STUDY ON SPATIAL ACCESSIBILITY AS A FACILITATOR OF SOCIAL COHESIVENESS IN NEIGHBORHOOD PARKS

A SYNOPSIS

Submitted by

SHANTA PRAGYAN DASH
(Reg. No. 9200114001)

in partial fulfillment for the award of the degree of

DOCTOR OF PHILOSOPHY

DEPARTMENT OF ARCHITECTURE

KALASALINGAM SCHOOL OF ARCHITECTURE

KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION

(DEEMED TO BE UNIVERSITY)

ANAND NAGAR, KRISHNANKOIL – 626 126

TAMIL NADU, INDIA

MARCH 2024

1. INTRODUCTION

Urban parks enhance the social life of community residents by promoting relaxation, recreation and social interaction within the spaces. As the cities grow, it is significant to analyze the availability of the green spaces and the accessibility attributes towards maintaining the social life of the residents. In the rapid pace of urbanization, the significance of shared public spaces is equally crucial towards creating social bonds amongst the community residents in urban areas. Research also revealed that the open spaces in an urban environment plays a significant role towards promoting various physical activities, social participation in various community aspects and community connectedness which, in turn, had contributed towards the overall wellbeing and improved the health outcomes. Open spaces also promote the cultural inclusion and engagement through participation in various community events and activities and creating a social relationship amongst its residents. These open spaces, in addition, also reduces the crime rate as communities are actively working together to protect their shared environment in a holistic way. Therefore, social cohesiveness in these open spaces is crucial towards developing a more sustainable and harmonious built environment. It enables a meaningful and diverse interaction amongst its residents thereby improving their safety and wellbeing aspects and developing sense of belonging to their neighborhood context.

Past studies have addressed that accessibility is a crucial aspect towards promoting social interaction in public spaces regardless of any physical limitations and economic status where the participants are involved in various shared activities. It was also investigated that open space visit has contributed significantly towards fostering social inclusion of its residents by bringing the diversity and inclusivity including the people with disabilities. This inclusivity also promotes civic participation and create inclusive environment through the formation of social bonds between the individuals belonging from different backgrounds nearby strengthening the social fabric of the neighborhood. Strategic and convenient locations in these open spaces also facilitate the development of meaningful relationships, the promotion of community well-being and solidarity, and the ease of access to essential services, recreational opportunities, and community gathering areas.

Past studies also revealed that accessibility and social cohesiveness have a

significant interrelationship towards successful usage of parks. However, the various attributes of spatial accessibility and its implications towards fostering social cohesiveness in the parks are unexplored. Furthermore, whereas accessibility to urban parks have been extensively studied in the context of cities, neighborhood parks, which are often smaller and closer to people's homes, have gained limited focus in terms of their influence on accessibility and social cohesion. There has been limited research on the specific aspects of access to local parks that may promote social interactions and community bonds. To gain a more comprehensive understanding of the role of neighborhood parks in community well-being, future research should look at the specific attributes of spatial accessibility to improve the wellbeing, as well as their direct influence towards fostering social cohesiveness amongst local residents.

2. REVIEW OF LITERATURE

Past research on the spatial accessibility and social cohesion in urban parks is an important field of urban space study towards giving an insight to the complex interplay between the park design accessibility and social cohesion in these open spaces. Several notable findings have examined various aspects of this inter-relationship providing valuable insights into urban planning and park management.

An empirical analysis by Lee and Kim [1] revealed that *regular park visit* and social cohesion have a strong association towards the decision of the users visiting the parks. Frequent park visits have shown a significant *increased community bonding* within the residents of the community. Furthermore, through a comparative study Mitchell and Popham [2] revealed that the neighborhoods with having a strong accessibility to parks have shown and higher level of social cohesion. Chiesura [3] investigated that park accessibility is positively correlated with establishing a strong community bond and sense of shared identity ultimately contributing towards social cohesiveness in these spaces within the residents of diverse backgrounds

In addition to physical accessibility, Kaczynski and Henderson [4] have also explored how *park infrastructure and activities* affect social connections in urban parks. Their findings demonstrated that parks that provide a diverse range of services and scheduled activities attract more visitors and foster more social cohesiveness among park users. Another research by Coley et al. [5] found that *park design elements* that enhance social cohesion, emphasized the significance of inclusive and

inviting places in fostering beneficial social interactions.

Behavioral insights have also helped us comprehend the dynamics of social cohesion in urban parks. Studies also revealed that *behavioral factors* that influence park utilization and social interactions and their importance of *perceived safety, comfort, and social norms* in shaping park visitors' behavior and relationships. Chawla [6] through an empirical research on the influence of *park activities and events* on social cohesion, indicated that well-planned activities might help park visitors form meaningful social relationships.

The significance of spatial accessibility towards promoting social interactions and developing community bonding has been highlighted in recent studies on open spaces and park visitation by Chavis and Wandersman [7]. Past researches by Cohen et al. [8], Maas et al. [9], Jackson and Abercrombie [10], Schipperijn *et al.* [11], Brown and Perkins [12] have explored the significance of park visitation towards promoting social interaction within the communities. The proximity to these parks with their attractiveness and the pocket the park for various activity facilitate the social interaction within the parks.

Jones and Brown [13] suggested that frequent park visitation inculcates a sense of social cohesiveness by developing a sense of belonging and the connectedness amongst the residents. Diverse social interactions have helped to break down the social barriers are foster a sense of empathy and cooperation as investigated by Nguyen [14]. Studies by Chen and Smith [15] have also reflected that such parks symbolize local identity and a sense of ownership and community pride for the residents.

Studies by Taylor and Clark [16] have investigated the link between park accessibility, social cohesion, and community well-being where they also had explored at the long-term effects of park accessibility improvements on social cohesion and people's quality of life. It discovered positive associations between increased park accessibility, social interactions, and indicators of *community well-being.* It also investigated that park accessibility increases social capital and collective efficacy in metropolitan areas emphasized the importance of *publicly accessible green areas with diverse backgrounds* as platforms for community building and civic engagement.

In terms of policy implications, an empirical study by Walker [17] evaluated

the effectiveness of numerous initiatives to improve park accessibility and social cohesion. Their findings emphasized the significance of comprehensive measures addressing physical, social, and cultural challenges to park access and participation.

Previous research on spatial accessibility and social cohesion in urban parks has highlighted the importance of *inclusive park design, programming, and policy interventions* in creating lively and harmonious communities. Through an in-depth review of the existing literature on accessibility, social cohesion and parks usage towards enhancing the successful usage of parks, the following research questions were framed:

- What are the factors that contribute to the successful usage of public parks?
- What are the indicators of accessibility that influence park visitation and usage?
- What are the variables of social cohesion that influence park visitation and usage?
- What are the attributes of spatial accessibility that facilitates social cohesion in parks during their visits, analyzing potential relationships?

After reviewing the existing research on park accessibility, social cohesion, and overall well-being it is clear that while these studies have provided valuable insights into the factors influencing park usage and social interactions, there is a significant research gap in terms of contextual analyses at the neighborhood level. Specifically, there is a lack of thorough understanding of which spatial accessibility features contribute the most significantly to social cohesiveness inside parks in certain neighborhood contexts. While previous research has identified various park design features, amenities, and programming that encourage social interactions and community engagement, there is still a need for detail analyses that consider the distinct characteristics and dynamics of different neighborhoods. Researchers can get detailed insights into the precise characteristics that promote social cohesiveness inside public parks by performing contextual studies that focus on neighborhood-level spatial accessibility qualities, resulting in more targeted and successful park development and management practices.

The identified research gap emphasizes the need for studies that go beyond general assessments of park accessibility and social cohesion to investigate the specific contextual factors shaping park usage patterns and social interactions across diverse urban neighborhoods. Such studies could use mixed-method approaches that combine quantitative analyses of spatial accessibility measures (e.g., proximity to

parks, connectivity, and public transportation availability) with qualitative assessments of community perceptions, preferences, and social dynamics. Furthermore, addressing this gap in the study has important consequences for urban planning and policymaking aimed at improving park accessibility and increasing social cohesion. Understanding spatial accessibility features which are strongly connected with positive social outcomes allows policymakers and planners to choose investments and interventions that address individual needs and preferences in distinct neighborhoods.

3. NEED OF RESEARCH

The study of how spatial accessibility enhances social cohesion in parks is vital for various aspects at neighborhood level. Firstly, it offers an empirical finding and recommendations to the urban planning and policy makers towards contributing for future design of parks within a neighborhood context at community level. Through the academic research on addressing the connection between park accessibility and social cohesion may help the city planners to design parks that improve *community ties and inclusiveness.*

Furthermore, this research may address issues about equity and inequity in park access, ensuring that green spaces are distributed equitably throughout communities. Understanding the impact of spatial accessibility on social bonds and community well-being enables academics to advocate for the creation and improvement of parks in underserved areas, resulting in a more *equitable society*. This study has practical implications for enhancing park design, safety, and amenities. Recognizing the factors that contribute to social cohesion guides the development of parks that encourage social interactions, physical activity, and overall *community health and wellbeing*.

4. RATIONALE

The rationale towards conducting the research is to determine the spatial accessibility variables as facilitators towards social cohesion in parks at the neighborhood level derives from an existing research gap and the need to address neighborhood-specific dynamics. While previous research has examined many aspects of park accessibility and the factors that impact social cohesion at urban level, this study undertakes a *neighborhood-specific approach* (contextual study).

The focus of this research is to explore the intricate relationship between

geographical accessibility and social cohesion, with the aim towards providing insights that may be utilized to inform choices about park location, design, and management. Furthermore, by emphasizing justice and inclusiveness, it promotes more equitable and socially cohesive communities, hence improving community well-being and quality of life. The major two significant aspects of the study are:

Assessing various *spatial accessibility attributes* in neighborhoods which is the crucial aspect of study. This research will investigate how the attributes influence residents' ability to utilize parks, interact with their neighbors, and, ultimately, contribute to social cohesion.

The research will evaluate accessibility attributes which are the *facilitators for social cohesion* in neighborhood parks. Understanding how these characteristics impact individuals' experiences and perceptions of parks may provide valuable insights into their contributions to social cohesion and community well-being.

5. AIM OF RESEARCH

The aim of the research is to investigate impact of spatial accessibility as a facilitator of social cohesiveness in public parks within residential neighborhoods through an analytical framework gaining a deeper understanding of the relationship between these aspects towards encouraging community bonds in these parks.

6. OBJECTIVES

- To *determine the spatial accessibility variables* towards park usage for improving public access and usability.
- To *identify the attributes of social cohesion* within parks, enabling a holistic understanding of the elements and initiatives that promote community bonding in these parks.
- To develop an *integrated conceptual framework* outlining spatial accessibility variables that contribute to social cohesion in neighborhood parks.
- To *validate the proposed park accessibility model* across the identified neighborhood parks and identify the most significant factors positively affecting social cohesion, providing insights to address and improve community bonds in these park spaces.
- To *propose recommendations* aimed towards strengthening the influence of

spatial accessibility on fostering social cohesion within neighborhood parks as guiding initiatives to create more inclusive community spaces.

7. SCOPE

The scope of study encompasses a focused investigation into six specific neighborhood parks situated in Udupi, a city located in the Indian state of Karnataka. The selection of these parks is carefully made, considering their contextual relevance within the Udupi municipal area and their scale in terms of size, facilities, and importance to the local community. These parks are deemed suitable for an in-depth study due to their accessibility and potential to offer valuable insights. The primary research approach involved conducting detailed park surveys aimed at comprehensively assessing the physical characteristics and amenities within these selected parks. This survey provided data on elements such as park size, layout, recreational facilities, greenery, and overall park infrastructure. Additionally, direct interviews with park visitors is conducted to gather qualitative data on their experiences, perceptions, and social interactions within these parks. This qualitative approach will allow us to delve deeper into the social dynamics and community bonding that occur within these public spaces.

Furthermore, the research plan includes the collection of secondary data, which is facilitated through collaboration with officials from the Udupi Municipal Corporation. This secondary information complements the primary data collected through surveys and interviews, providing a comprehensive understanding of the parks' contextual and administrative aspects. The main goal of this research is to explore and analyze the relationship between accessibility and social cohesion within these seven neighborhood parks. The findings from this study are expected to shed light on the factors that contribute to or hinder social cohesion in urban parks, with a specific focus on the Udupi context. Ultimately, the research aims to offer valuable insights and recommendations for urban planning and park management strategies, emphasizing the creation of more inclusive and community-oriented public spaces in Udupi.

8. LIMITATIONS

The limitations of this study encompass several factors that may impact the generalizability and depth of its findings. The research is centered on the Udupi

municipal area, and its findings are primarily tailored to neighborhood parks within this region, considering the unique demographics, cultural backgrounds, and urban development characteristics specific to Udupi. Consequently, their direct applicability to other urban settings with differing characteristics may require careful consideration and adaptation. The study predominantly utilizes direct interviews with park visitors, providing valuable insights into the perspectives and experiences of those who actively use the park. However, it's important to note that the study may not fully capture the views and experiences of individuals who do not regularly visit parks. The study maintains its focus on the core variables of park accessibility and social cohesion without considering external factors like broader economic conditions, urban planning policies, or natural disasters, which may also play a role in shaping these aspects and could be subjects for further research.

9. RESEARCH APPROACH

A correlational research design was adopted to achieve the research aims and objectives outlined above. The research process in this study involved both model development and model validation, with a focus on quantifying the relationships between variables. Firstly, an intensive literature review was conducted to identify the variables of spatial accessibility though validated empirical studies which had played a significant role towards regular park visit for all aged groups. Secondly, the literature study also reviewed the variables that contribute towards successful social cohesiveness amongst the park users. Thirdly, through a comparative review from the objective and subjective measures and socio-physical conditions which can influence an individual’s ability to use a park, an integrated conceptual framework was proposed. The model represents park spatial accessibility variables as a multidimensional construct, describing both physical and non-physical factors that are likely to influence social cohesion in parks. Fourthly, the proposed model was then empirically tested and validated using primary data collected from neighborhood-level surveys.

The study is carried out in Udupi, a semi-urban city in the state of Karnataka, India. The study was limited to Udupi due to its accessibility and availability for contextual analysis. This decision was made in light of potential limitations in accessing data from other cities within the given time constraints. By confining the study to parks within Udupi, the research team was able to thoroughly investigate and

analyses the selected parks within the defined parameters. Targeting towards specific study area, Udupi Municipal Co-operation initially provided a list of 33 parks and open spaces within the Udupi taluk. To rationalize the selection process, specific selection criteria were established for inclusion and exclusion through an inventory. Firstly, parks classified as playgrounds (9 nos.), those surpassing the size threshold for neighborhood parks (12 nos.), and those under private ownership (1 nos.) were eliminated. Furthermore, parks lacking sufficient access to arterial roads (2 nos.) or primarily catering to tourism purposes and situated along national highways (3 nos.) were also excluded. After the application of these criteria, the list was limited to 6 parks for further analysis which comes under the category of neighborhood parks with neighborhood size of 500 km radius, population density of 5000, with the area of 0.50 to 1.00 (Ha) i.e. 1.2 to 2.4 acres or 4856.2 sqm to 9712.4 sqm area per the Urban and Regional Development Plans Formulation and Implementation (URDPFI) guidelines. The selection process primarily targeted parks that met specific criteria pertaining to their size, location, and accessibility. Emphasis was placed on parks falling within the 1.25 to 2.5-acre range, as this aligned with the objectives of the study. Additionally, the chosen parks had to be situated within a 500-meter radius of the surrounding neighborhood, ensuring easy access for nearby residents. A positivist paradigm was used in this research that necessitated the quantitative approach, and accordingly a survey strategy was adopted. Deductive reasoning based on the conceptualization through earlier research was the basis for the development of the hypothetical model. A sample size of 249 was used based on convenience sampling technique and the data collection was through a questionnaire. The analysis was carried out with a mixed method approach (both qualitative and quantitative). The variables were analyzed under two subsets. The first subset, which had a direct impact on the park usage, was analyzed through using Space Syntax theory as its base analytical tool, undertaking a comprehensive approach for spatial analysis at the city and neighborhood level. Visibility Graph Analysis (VGA) was conducted for assessing sightlines at the park level, and a Three-Step Analysis process was performed to investigate the accessibility preference to these parks at the neighborhood context level. The second subset, which had an impact after the park usage was analyzed from survey responses. The questionnaire was a derivative of standard scales; hence, Confirmatory Factor Analysis (CFA) was carried out to ensure the reliability and validity of the data and the metric.

Analysis of Variance (ANOVA) was used to test the association of demographic factors and Structural Equation Modelling (SEM) was used to test the hypotheses. Accordingly, implications were made through recommendations for the benefit of the urban designers and policy makers, so as to move towards sustainable approach in public parks design.

10. ORGANIZATION OF THESIS

The thesis comprises six chapters structured to provide a comprehensive exploration of the research topic. The initial chapter serves as an introduction, setting the stage for the study. Following this, a critical review of literature is presented, culminating in the development of the theoretical framework and conceptual models guiding the research. Chapter 4 delineates the research design and methodology, covering aspects such as data requirements, sampling strategies, and analytical techniques. Chapters 5 form the core analytical sections, each addressing key research objectives. The final chapter offers a synthesis of findings, reflections on the study, and outlines future research priorities. Figure-1 illustrates the interconnectedness of these chapters in relation to the overarching research objectives.

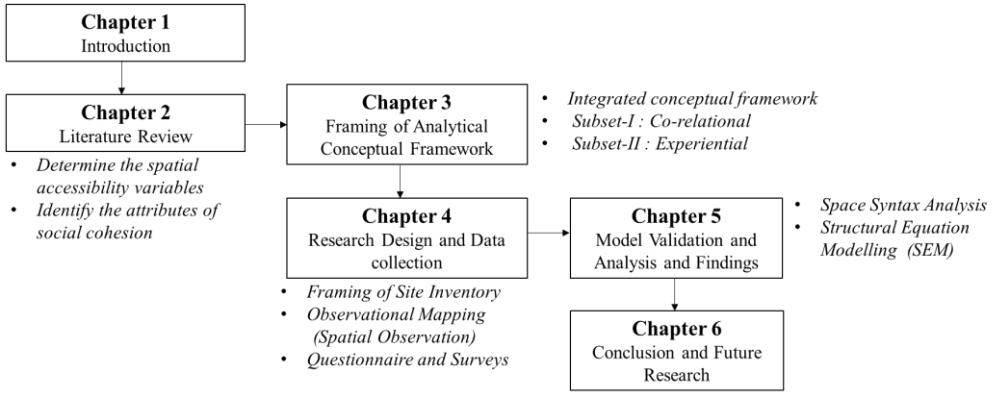

Figure-1: Structure of Thesis

Chapter 1

Chapter 1 provides an overview of the research, encompassing the research context and background of the research. The statement of the problem, aim, objectives, scope and limitations, rationale and approach of research is summarized. The overall thesis structure and the overview of chapters are discussed.

Chapter 2

Chapter 2 summarizes literature review which comprehensively examines previous studies, cases, tools, and methods towards analyzing the spatial accessibility and social cohesion in parks. It synthesizes the understanding of related attributes of

spatial accessibility and social cohesion, highlighting key findings and insights. Identified research gaps in these areas are discussed, providing direction for the study. The chapter concludes with a summarized review of the literature, emphasizing the need for further investigation.

Chapter 3

Chapter 3 serves as the methodological framework for conducting the research. It will integrate the findings from the literature review, the analytical conceptual framework, and the analysis that will be conducted using both qualitative and quantitative approaches. It provides a systematic framework for evaluating the link between accessibility and social cohesiveness in relation to park visitors, and it outlines the qualitative and quantitative methodologies that were utilized in the process of data collection and analysis.

Chapter 4

Chapter 4 presents a descriptive study on the availability of neighborhood parks and the social and spatial characteristics within Udupi city. It gives an overview of the study area context, including relevant geographical, demographic, and other related factors outlining the criteria used for the selection of parks, considering factors such as size, location, and amenities. It provides an analysis of the current status of neighborhood parks, exploring their accessibility and features. Additionally, the chapter examines the social dynamics and spatial attributes surrounding these parks. Through detailed observation and analysis, it offers insights into the context of neighborhood parks within Udupi city, contributing to a better understanding of urban park environments.

Chapter 5

Chapter 5 presents the interpretation of the analysis and addresses the research questions by empirically validating the study results. It summarizes the qualitative analysis through application of analytical tools towards identifying the significance of the independent variables towards affecting the dependent variables. The second part of analysis includes statistical analysis of responses to social cohesion parameters, offering insights into the dynamics of neighborhood park environments.

Chapter 6

Chapter 6 provides a cohesive synthesis of the research findings from preceding chapters, offering a comprehensive overview of the study outcomes. By integrating the

results, this chapter addresses the identified research questions and provides insights into their implications. Furthermore, it offers recommendations for future research priorities, highlighting areas that require further investigation.

11. REFERENCES

1. Lee, H., & Kim, Y., Park Accessibility and Social Capital: A Study of Urban Neighborhoods. *Urban Affairs Review*, **58** (1) (2022), 102-123.

2. Mitchell, R., & Popham, F, Effect of exposure to natural environment on health inequalities: an observational population study, *The Lancet*, **369** (9561) (2007), 1622-1628.

3. Chiesura, A., The role of urban parks for the sustainable city. *Landscape and Urban Planning*, **68** (1) (2004), 129-138.

4. Kaczynski, A. T., & Henderson, K. A, Parks and recreation settings and active living: A review of associations with physical activity function and intensity. *Journal of Physical Activity and Health*, **4** (s1) (2007), S7-S24.

5. Coley, R. L., Sullivan, W. C., & Kuo, F. E.,Where does community grow? The social context created by nature in urban public housing. *Environment and Behavior*, **29** (4) (1997), 468-494.

6. Chawla, L., Research methods to investigate significant life experiences: Review and recommendations. *Environmental Education Research*, **12** (3-4) (2006), 359-383.

7. Chavis, D. M., & Wandersman, A., Sense of community in the urban environment: A catalyst for participation and community development. *American Journal of Community Psychology*, **18** (1) (1990), 55-81.

8. Cohen, D. A., Han, B., Isacoff, J., Shulaker, B., Williamson, S., & Marsh, T., Impact of park renovations on park use and park-based physical activity. *Journal of Physical Activity and Health*, **13** (1) (2016), 82-89.

9. Maas, J., Verheij, R. A., Groenewegen, P. P., de Vries, S., & Spreeuwenberg, P., Green space, urbanity, and health: How strong is the relation? *Journal of Epidemiology & Community Health*, **60** (7) (2009), 587-592.

10. Jackson, R., & Abercrombie, L., Community identity and park use: A qualitative study. *Journal of Community Psychology*, **43** (3) (2015), 325-342.

11. Schipperijn, J., Cerin, E., Adams, M. A., Reis, R., Smith, G., Cain, K., & Sallis, J. F., Access to parks and physical activity: An eight-country comparison. *Urban forestry & urban greening*, **27**, (2017), 253-263.

12. Brown, A., & Perkins, D., Diverse social interactions in urban parks: A systematic review. *Journal of Urban Design*, **24** (1) (2019), 76-94.

13. Jones, S., & Brown, D, Park Accessibility and Social Cohesion: A Comparative Study of Urban Neighborhoods. *Journal of Urban Studies*, **36** (4) (2019), 450-467.

14. Nguyen, T., Behavioral Insights into Park Usage and Social Interactions: Implications for Urban Planning. *Journal of Environmental Planning and Management*, **63** (12) (2020), 2218-2236.

15. Chen, L., & Smith, J., Cost-benefit Analysis of Park Accessibility Improvements: Implications for Social Cohesion and Public Health. *Landscape and Urban Planning*, **178**, (2018), 234-245.

16. Taylor, R., & Clark, E., Park Programming and Social Cohesion: A Case Study of Urban Parks. *Leisure Sciences*, **41** (4) (2019), 337-352.

17. Walker, J., Enhancing Park Accessibility and Social Cohesion: Policy Implications. *Journal of Planning Education and Research*, **40** (3) (2020) 358-372.

PUBLICATIONS

1. **Dash, S. P.,** & Thilagam, N. L. (2023). Creative placemaking: A conceptual model fostering social cohesion in community spaces within residential environments. Creativity Studies, **16** (2), 541-564.
2. **Dash, S. P.,** & Thilagam, N. L. (2023). Developing a conceptual framework of creative placemaking for social cohesion. Theoretical and Empirical Researches in Urban Management, **18** (1), 5-26.
3. **Dash, S. P.,** & Thilagam, N. L. (2022). A Systematic Review on Inter-Relationship of Residential Neighborhood Characteristics on Quality of Life of Elderly. Pertanika Journal of Social Sciences & Humanities, **30** (4), 1533 – 1566.
4. **Dash, S. P.,** & Thilagam, N. L. (2022). A Study on Inter-Relationship of Open Space and Social Cohesion for Wellbeing of Elderly: A Systematic Literature Review. International Journal of Built Environment and Sustainability, **9** (1), 55-72.